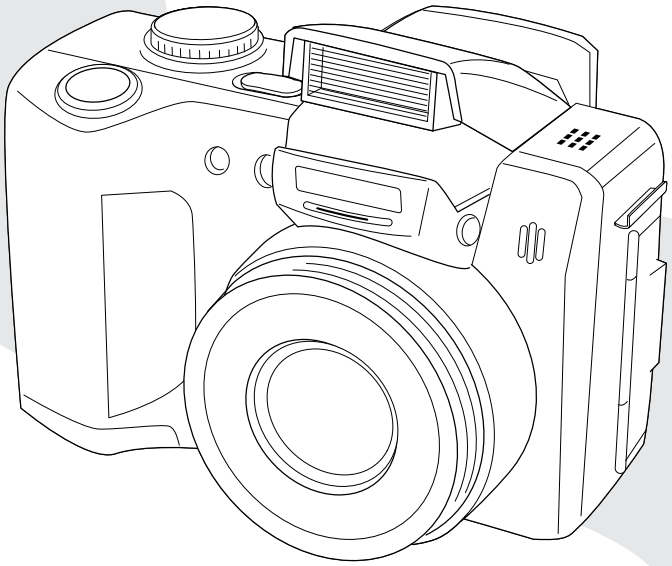
TOSHIBA

FILE NO. 210-200316

SERVICE MANUAL

DIGITAL STILL CAMERA

PDR-M500



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TOSHIBA PDR-M500

Service Manual

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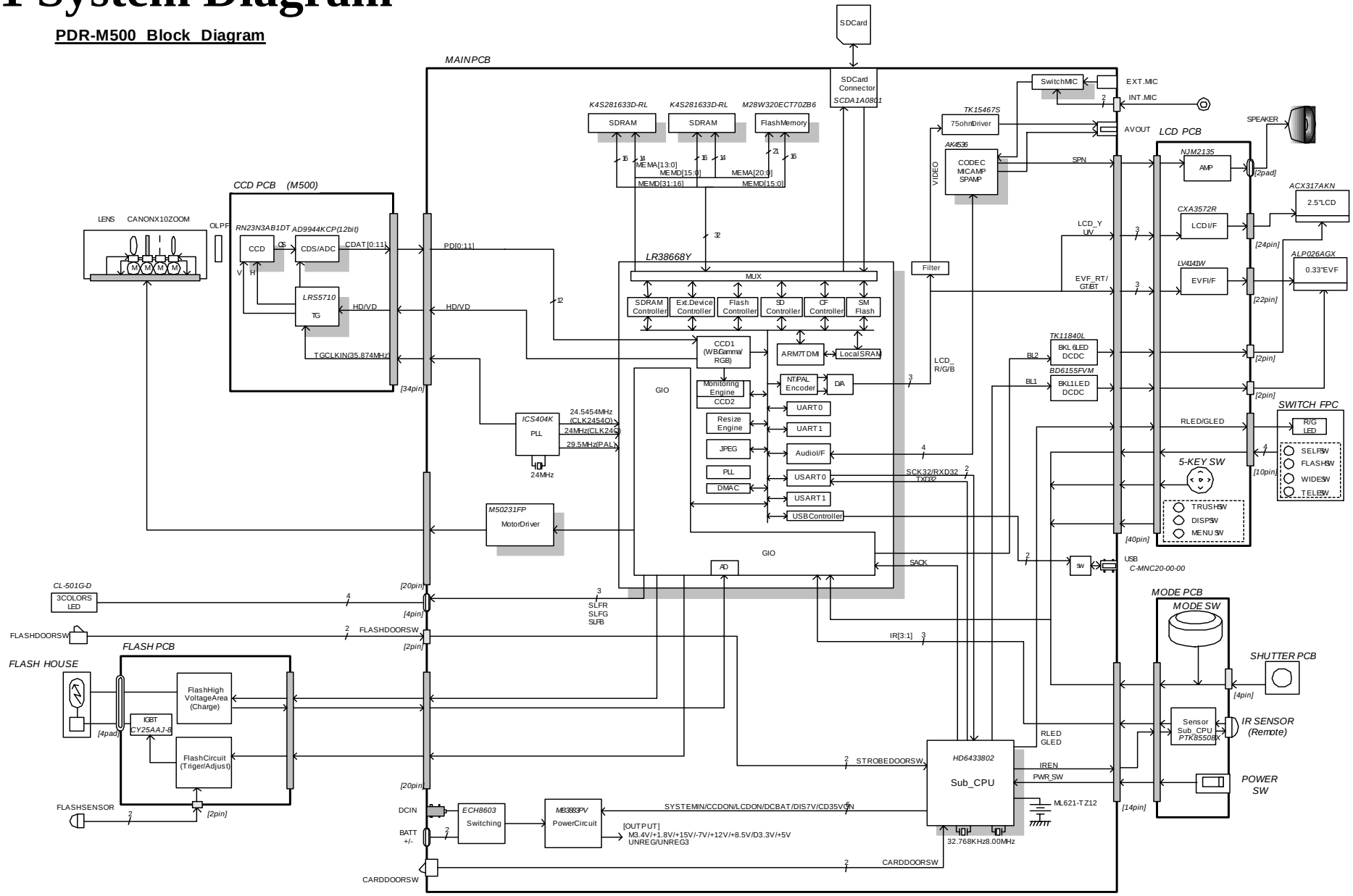
Prepared by Premier Image Technology Corp.

Section 1. System Overview

1-1 System Diagram

PDR-M500 Block Diagram



1-2 System Overview

The PDR-M500 consists of 7 PC boards (the Main PCB, CCD PCB, Flash PCB, LCD PCB, Switch PCB, Mode PCB and Shutter PCB), a lens unit, a color LCD, a color EVF unit, a flash unit, etc.

The lens unit consists of a CANON 10X zoom lens and built-in shutter motor, an aperture motor, a zoom motor and a focus motor.

The color EVF unit is a lens with an incorporated 110,000 pixel SANYO 0.33” liquid crystal display (ALP026AGX) and has a backlight consisting of 1 LED.

The color LCD is a 110,000 pixel SONY 2.5” liquid crystal display (ACX317AK) with a backlight consisting of 6 LEDs.

The flash unit includes a xenon tube, diffusion lens and trigger coil.

The Main PCB consists of a CODEC (U101) controlling the audio input/output, a DSP (U901/SHARP LR38668) controlling signal processing and user interface and including the camera’s main CPU (ARM) which conducts all control directly after the power is turned on, a PLL (U902) generating all clocks aside from those for the sub-CPU (U401), SDRAMs (U300 and U301) in which the image data and program data is stored, a FlashROM (U304) storing the program data and adjustment data for the lens, etc., a motor driver (U505) driving the motors, a power control IC (U10) controlling various voltages, a sub-CPU (Main PCB – U405/HITACHI HD6433802) supplementing the DSP (U901) with power supply management and calendar functions, etc.

Power is supplied by four AA batteries or a 5V AC adaptor.

The CCD PCB consists of a timing generating IC (UB50), a 2MCCD (UB10, SHARP RN23N3AB1DT) and an AD converter (UB11). The pulses generated by UB50 drive the CCD (UB10) to acquire image signals that are converted into digital signals and output from the AD converter (UB11), and control of the timing generating IC (UB50) is conducted by the Main PCB DSP (U901).

In the Flash PCB, the 300V voltage is boosted to the flash capacitor (160uF/300V) by the charging boost transformer (T150) for charging and high voltage pulses are generated by the IGBT (Q165) to emit the flash. The quantity of light emitted is determined by the reflected light of the photo sensor connected to the Flash PCB.

For the LCD PCB, the Y color difference signals from the DSP (U901) are input to the 2.5” liquid crystal display driver IC (U600/CX3572R) to drive the 2.5” liquid crystal display (ACX317AK). For the EVF output, the RGB signals from the DSP (U901) are input to the 0.33” EVF driver IC (U702/LV4141W) to drive the 0.33” EVF (ALP026AGX). There is also a speaker AMP (U770) whose input signals are signals from the CODEC (U101).

The Switch PCB consists of the zoom button switch, flash button switch and self-timer button switch.

The Mode PCB consists of a mode dial (S802), POWER switch key (S800) and remote control signal receiver (U1). The shutter key information and other data is output to the Main PCB microprocessor (U405) and DSP (U901).

The Shutter PCB consists of a shutter button and other parts.

1-2-1. Startup operation

When batteries are loaded or the AC adaptor is connected, a 3.0V voltage for the sub-CPU is generated by U402 and supplied to the sub-CPU (U405). When the POWER switch (S800) is turned on in this status, the camera switches to the boot-up sequence.

The sub-CPU (U405) conducts the power on control until the main voltage supplied to the DSP (U901) and other parts is supplied. When the AC adaptor is connected, it is identified and turns on the power. If the AC adaptor is not connected, the battery voltage is checked and the power only turns on if the voltage is strong enough to turn it on.

Once the power is turned on, the power off operation is conducted by the DSP (U901) exchanging data with the CPU (U405) to check the battery voltage information, and if the voltage is below the stipulated value a command is issued to turn the power off with the POWER switch.

1-2-2. Power off operation

The power off operation is conducted by the DSP (U901) exchanging data with the sub-CPU (U405) to check the battery voltage information, and if the voltage is below the stipulated value a command is issued to turn the power off with the POWER switch.

In the standby mode after the power has turned off, only the calendar function of the sub-CPU (U405) operates and the camera stands by for the power to be turned on next. The calendar function remains operating for a specific amount of time even if the AC adaptor is disconnected and no batteries within camera, the camera's built-in coin battery (BT1) keeps operation tell a certain fixed time.

1-2-3. Image capturing mode

The DSP (U901) switches to the image capturing mode when the mode dial is set to the image capturing status. When the shutter button is pressed in this status, the DSP (U901) issues the image release command to the CCD driving IC (UB50) in order to obtain the image from the CCD (UB10), and the image signals from the CCD (UB10) are converted into digital signals by the AD converter (UB11) and output to the DSP (U901). When the image data is input to the DSP (U901), the DSP (U901) conducts the operation for processing the signals, converting them into YCrCb signals then into JPEG format and writing this on the SD card. The DSP (U901) uses the SDRAMs (U300 and U301) for the signal processing operations and for temporary data storage.

1-2-4. Display mode

The DSP (U901) switches to the display mode when the mode dial is set to the display status. Data is loaded from the SD card and the image is displayed on the LCD or EVF. When a video cable is connected, the data is only output from the video cable. The DSP (U901) converts the SD card’s images from JPEG to YCrCb format in order to display them on the LCDs. The SDRAMs (U300 and U301) are used at this time.

1-2-5. Lens module control

The lens module consists of shutter, aperture and focus motors. A current drive motor is used for the shutter, step motors are used for the aperture, focus and zoom. The initial positions of the focus and zoom are determined by a photo interruptor inside the lens module. The step motor determines the focus position based on this. The pulses applied to the motor are applied to the motor drive IC (U505) from the DSP (U901) and amplified to drive the lens motor.

1-2-6. Auto focus/ Auto exposure (AF/AE)

The results of several pre-captures are processed in the DSP (U901) in order to determine the optimum focus position and aperture/shutter time. When taking still pictures, the AE/AF operation is only performed when the shutter button is pressed half way.

1-2-7. Auto white balance

The DSP (U901) calculates the RGB values from the raw data output from the AD converter (UB11), the ARM performs calculations to obtain the gain comparisons of the RGB color signals, and the CCD1 module in the DSP (U901) is controlled.

1-2-8. Adjustment data and camera setting data

The CCD scratch data and the AF, AE, AWB and other camera adjustment data is written in the FROM (U304). Menu setting data is written in the sub-CPU (U405). The sub-CPU data is retained as long as the voltage of the secondary coin battery on the Main PCB is 1.8V or greater.

1-2-9. SD card data access

The data is transferred from the DSP (U901) in the direct SPI mode.

1-2-10. Flash control

The DSP (U901) detects the STRDY signal from the flash circuit and checks whether charging is completed. If not, the STSTART signals becomes high (H), and charging continues until the STRDY signal becomes low (L). If charging is not completed after the specified time (about 30 seconds), it is deemed there is an error and charging is interrupted. Flash charging processing is not conducted if the flash mode is set to no flash.
The flash is emitted when the DSP (U901) switches the STXON signal from L to H. The quantity of light is controlled by the lighting control sensor. The flash is only emitted when charging has been completed. Capturing of the next image is prohibited until charging is completed.

1-2-11. Power supply control

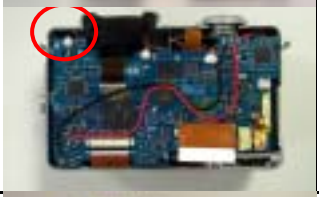
For the supply of power, the main converter IC (U10) generates voltages of 3.4V for the motors, 1.8V for the DSP, 15V for the CCD, -7V for the CCD, 12V for the LCD, 8.5V for the EVF, 3.3V for the digital circuitry, and 5V for the CCD and flash. The 3.4V voltage for the motors is used to drive the motors and as the power source for the EVF backlight IC (U02). For the LCD backlight, a voltage of 21V is supplied by the IC (U03). The power ON/OFF signals are generated by the sub-CPU (U405).

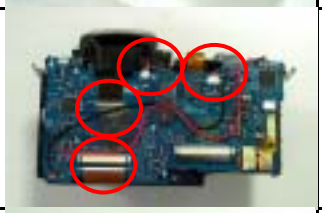
1-2-12. Program loading sequence

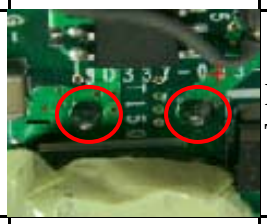
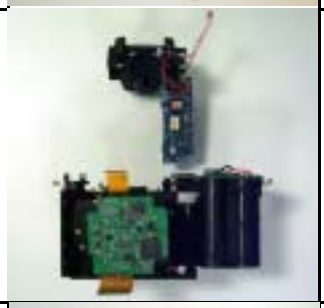
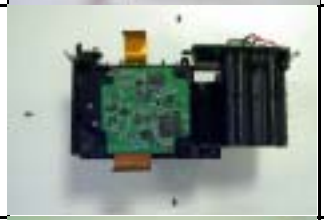
The camera switches to the program load sequence when the MENU or trash key is held in while the camera’s power is being turned on with the power switch from the power off status when a binary file (PDR-M500.BIN) is provided on the SD card.
When the MENU key is held in, the camera begins operating according to the program in the “PDR-M500.BIN” file on the SD card but the operation for loading in the FlashROM (U304/M28W320ETC70) in the camera is not performed. When the trash key is held in, the program in the “PDR-M500.BIN” file on the SD card is first loaded in the FlashROM (U304/M28W320ETC70) in the camera.

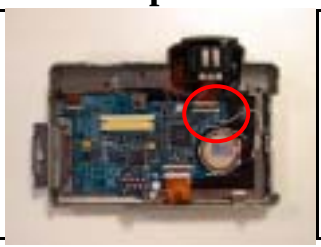
Section 2. Disassembly / Assembly

2-1 Disassembly

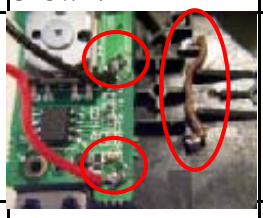
	Step	Figure	Discription	Remark	Tools
Disassembl procedures	1		Finished Product	Check if there's any scratch on the surface.	
	2		Remove the screws 01635-236*5 from the camera		Screw driver
	3		Open the Card Cover A260 and the Jack Cover A250.		
	4		Remove the Rear Assembly carefully not to damage the Flex Cable Main-LCD H600 or the connectors.	The Battery Cover ASSY A140 can be easily taken off from the camera.	Tweezers
	5		Detach the Flex Cable Main-LCD H600 from the connector on LCD PCB ASSY U410.		
	6		Detach the wire of Microphone ASSY H320 from camera.		Tweezers
	7		The camera after removing the Rear Assembly. (top view)		
	8		Stick the Mode Dial A410 by acrylic bar then pull up the cap.	Check if the stickiness of acrylic bar is strong enough to remove the capt.	Acrylic bar

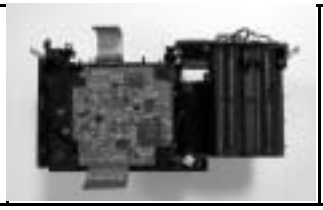
	9		Remove the screws 01635-350*2 from the camera to remove the base of Mode Dial A410.		Screw driver
	10		Remove the screw 01635-149 from the Tripod Holder A340. Remove the Flex Cable Main-LCD H600 from the Main PCB ASSY U100.		Screw driver Tweezers
	11		Remove the screw 01635-000 from the Main Frame A300.		Screw driver
	12		Hold Pushing the Flash Open Switch A440 and pull up the Jack Cover A250 to separate the Main Frame A300.	Check the small kinks on the surface of Main Frame A300 are appeared.	
	13		Pull out the Main Frame A300 from the Front Cover ASSY A100 with finger as shown.		
	14		Remove the Front Cover ASSY A100 from the camera.	Jack Cover A250 and the pin will drop down in the meantime.	
	15		Detach the wire from Flash PCB KIT U300 as shown. Detach the FPC cable from Lens Module ASSY H100.		Tweezers
	16		Desolder the wires from the Mode PCB ASSY U510.		Soldering iron
	17		Remove all the screws 01635-000*3 from the camera.		Screw driver

	18		Detach the Flex Cable Main-Mode H610 to remove the Main PCB ASSY U100 from the camera.	Detach the Flex Cable Main-Mode H610 from the Mode PCB ASSY U510.	
	19		Discharge the solder joints of big capacitor beside the Flash PCB KIT U300.		Discharger Tweezers
	20		Remove the screws 01635-000*4 of Flash PCB KIT U300. Detach the wire from Photo Sensor ASSY H500 as shown.		Screw driver Tweezers
	21		Remove the screw 01635-000 of Flash PCB KIT U300 as shown.		Screw driver
	22		Remove the Flash PCB KIT U300 as shown. And the Flash Open Switch A440 can be easily taken off.	Be careful not to damage the CCD PCB of Lens Module ASSY H100 while taking it off.	
	23		Remove the Flash Open Switch A440 from the Main Frame A300.		Tweezers
	24		Remove the screws 01635-149*3 of Lens Module ASSY H100 as shown.		Screw driver
	25		Lens Module ASSY H100 and Main Frame A300.		

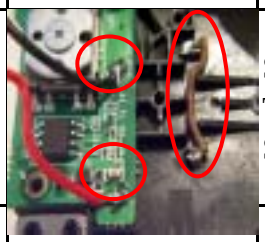
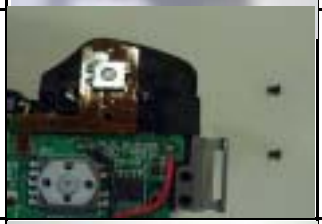
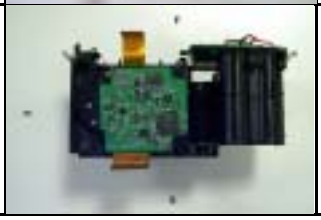
To disassemble the Speaker ASSY H310 (after step 5)					
	5a		De-solder the wires from the Speaker ASSY H310. Then remove it from the back of LCD with tweezers carefully.		Soldering iron Tweezers
To disassemble the Color LCD sub-assembly (after step 5a)					
	5a1		Remove the screws 01635-223*3 and 01635-000*1 on the Switch PCB ASSY U500.		Screw driver
	5a11		Take off the Switch PCB ASSY U500 carefully not to damage the cap of the connector.		Tweezers
	5a12		Detach the wire and FPC. Remove the screw 01635-000 to take off the Electric View Finder ASSY H220.		Tweezers Screw driver
	5a13		Detach the LCD Wire 2P H620 and FPC cable as shown.		Tweezers
	5a14		Remove the screws 01635-148*3 to take off the LCD PCB ASSY U410.		Screw driver
	5a15		Remove the screws 01635-042*3 to take off the Color LCD ASSY H200.		Screw driver
	5a16		Detach the LCD Wire 2P H620 from the Color LCD ASSY H200 as shown.		Tweezers

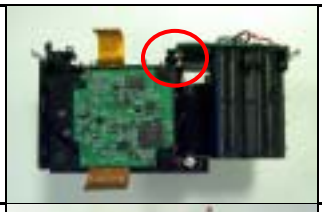
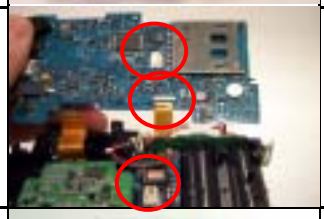
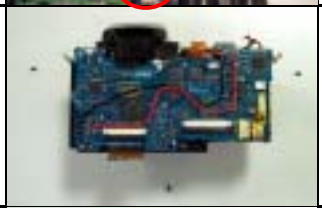
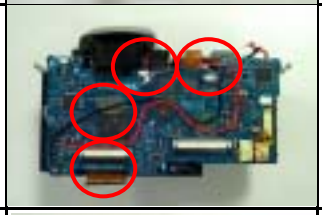
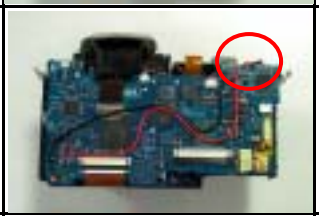
	5a17		Rear Cover ASSY A110.		
To disassemble the Card Cover sub-assembly (after step 5)					
	5a2		Remove the two screws 01635-086*2 as shown.		Screw driver
	5a21		Remove the Card Cover metal plate.		Tweezers
	5a22		Push the Card Cover pins.		Tweezers
	5a23		Card Cover A260.		
To disassemble the Microphone sub-assembly (after step 14)					
	14a		Remove the sticked Microphone ASSY H320 from the back of Front Cover A100.		Tweezers
To disassemble the Tripod Holder sub-assembly (after step 14)					
	14b		Remove the screws 01635-236*2 of the Tripod Holder A340.		Screw driver
	14b1		Remove the Tripod Holder A340.		

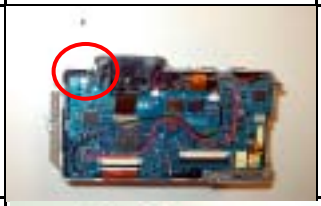
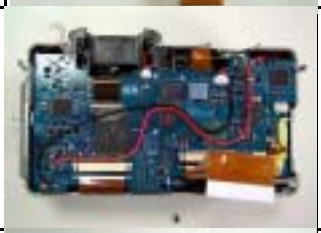
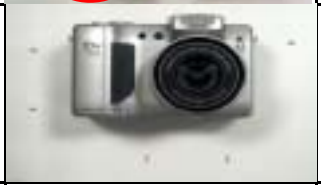
To disassemble the Battery terminals sub-assembly (after step 15)					
	15a		The top view of camera of step 15.		
	15a1		Remove the screws 01635-042*2 of Shutter PCB ASSY U520 and take off the Shutter PCB ASSY.	Open the cap of connector before remove the Shutter PCB U520 as shown.	Screw driver Tweezers
	15a2		Remove the screws 01635-010*2 on Mode PCB ASSY U510. Desolder the wire joints as shown.		Screw driver Soldering iron
	15a3		Pull up the Mode PCB ASSY U510 after the solder being cleaned.	Watch out the IR Receiver ASSY should not be damaged.	Tweezers
	15a4		Remove the screws 01635-042*2 inside the Battery Chamber.		Screw driver
	15a5		Remove the screw 01635-010 outside the Battery Chamber.		Screw driver
	15a6		Pull down the Battery Chamber ASSY as shown.		
	15a7		Remove the screws 01635-164*4 to separate the Battery Terminal A600. The camera disassemble procedure is finished.		

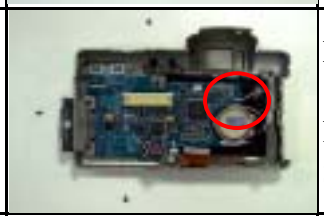
To disassemble the Photo Sensor sub-assembly (after step 22)					
	22a		Remove the Photo Sensor ASSY H500 as shown. The wires had been sticked by the sponge.		Tweezers

2-2 Assembly

	Step	Figure	Discription	Remark	Tools
Assemble procedures	1		Install all the Battery Terminal A600 and drive the screws 01635-164*4 to the Battery Chamber.		Screw driver
	2		Install the Battery Chamber into the Main Frame A300.		
	3		Drive the screw 01635-010 of Main Frame A300.		Screw driver
	4		Drive the screws 01635-042*2 of Main Frame A300.		Screw driver
	5		Install the Mode PCB ASSY U510 to the Main Frame A300.	Watch out the IR Receiver ASSY should not be damaged.	
	6		Screw up the screws 01635-010*2 and solder the wire and Battery Terminals on Mode PCB ASSY U510.		Soldering iron Tweezers Screw driver
	7		Connect the FPC of Shutter PCB ASSY U520 then drive the screws 01635-042*2.		Screw driver
	8		Install the Lens Module ASSY H100 to the Main Frame A300.		
	9		Drive the screws 01635-149*3 to the Lens Module ASSY H100.		Screw driver

	10		Install the Photo Sensor ASSY H500 to the camera.		
	11		Install the Flash Open Switch A440. Then install the Flash PCB KIT U300 into the camera.	Check the Flash Open Switch A440 can work well before assemble the Flash PCB KIT U300.	
	12		Drive the screw 01635-000 to the Flash PCB KIT U300.		Screw driver
	13		Drive the screw 01635-000*4 to the Flash PCB KIT U300.		Screw driver
	14		Connect the wire of Photo Sensor H500 to Flash PCB KIT U300.	The Flex Cable Main-Mode H610 might be inserted on the Mode PCB ASSY U510 first.	Tweezers
	15		Connect the Flex Cable Main-Mode H610 to Main PCB ASSY U100. Put down the Main PCB on camera.	Be careful of the male & female connectors of Flash PCB KIT and Mode PCB.	Tweezers
	16		Screw up the screws 01635-000*3 of Main PCB ASSY U100.	Watch out the connectors at the left-hand side of Main PCB ASSY not to misaligned.	Screw driver
	17		Install the wires from Flash PCB KIT U300 to the Main PCB ASSY U100. Install the FPC cable of Lens.		Tweezers
	18		Solder the wires on Main PCB ASSY U100.		Soldering iron

	19		Install the Jack Cover ASSY A250 as shown. Assemble the Front Cover ASSY A100 to camera. Check the position of Power Switch first.	The Microphone ASSY H320 might be inserted on the Front Cover ASSY.	
	20		Connect the wire of Microphone ASSY H320 to camera. Drive the screw 01635-000 as shown.		Screw driver Tweezers
	21		Install the Flex Cable Main-LCD H600 on the camera.		Tweezers
	22		Drive the screws 01635-149 of Tripod Holder A340.		Screw driver
	23		Install the Mode Dial ASSY A410 to camera. The screws are 01635-350*2.		Screw driver
	24		The top view of camera.		
	25		Install the Battery Cover ASSY A140 as shown. Install the Flex Cable Main-LCD H600 on the Rear Assembly.		
	26		Drive the screws 01635-236*5 of Front Cover ASSY A100.		Screw driver

	27		Finished Product		
To assemble the Card Cover ASSY A260 (before step 25)					
	25a		Card Cover A260.		
	25a1		Insert the Card Cover pins.		Tweezers
	25a3		Install the Card Cover metal plate.		Tweezers
	25a4		Drive the two screws 01635-086*2 as shown.		Screw driver
To assemble the Rear Cover sub-assembly (before step 25)					
	25b		Drive the screws 01635-042*3 to fix the Color LCD ASSY H200.	The Color LCD ASSY H200 is composed of 4 individual components.	Screw driver
	25b1		Drive the screws 01635-148*3 to fix the LCD PCB ASSY U410. Solder the wires.	Stick the Speaker ASSY H310 at the right position.	Soldering iron Screw driver
	25b2		Connect the LCD Wire 2P H620 and FPC cable as shown.		

	25b3		Install the Electric View Finder H220. Connect the wire. Drive the screw 01635-000 to fix it.		Screw driver
	25b4		Install the Switch PCB ASSY U500 carefully not to damage the cap of the connector.		
	25b5		Drive the screws 01635-223*3 and 01635-000*1 on the Switch PCB ASSY U410.	The Switch PCB Holder (metal frame) is re-used.	Screw driver
	25b6		Finished Product of Rear Assembly.		

Section 3. Calibration

3-1 The items need to be calibrated

Change parts	Part Code	LCD	EVF	Sensitive Aperture Shutter Defect pixel White balance	Focus	Strobe	Firmware update
Lens Module	H100	-	-	o	o	-	-
Color LCD	H200	o	-	-	-	-	-
Electric View Finder	H220	-	o	-	-	-	-
Photo Sensor	H500	-	-	-	-	o	-
Main PCB	U100	o	o	o	o	o	o
Flash PCB KIT	U300	-	-	-	-	o	-
LCD PCB	U410	o	o	-	-	-	-
Switch PCB	U500	-	-	-	-	-	-
Mode PCB	U510	-	-	-	-	-	-
Shutter PCB	U600	-	-	-	-	-	-
Internal Data format damaged	o	o	o	o	o	o	o

o:Need to be calibrated

3-2 Equipments

1) Light Source
LSB-6DM/10 manufactured by TSUBOSAKA ELECTRIC CO, LTD. or equivalent
Light value : 12 +/-0.1LV
Color temperature : 5100 +/- 300K

2) Oscilloscope
Input: 2 inputs and a trigger input (total 3 inputs)

3) Collimator Lens
DLB-50-450PM manufactured by SIGMA KOKI CO, LTD.
f = 450mm

4) Focus Test Chart
Supplied as PDF file “TEST_CHART.pdf” used by printing on A3 size.

5) Power Supply: AC Adapter
AC adapter or DC power supply set to 5.0V/3A

6) USB cable (accesory)

7) Dark room
Prepare an environment allowing a complete light sealed for a distance of 0.9m.

8) 18% Gray Chart
Size: 1m(W) * 1m(H) or more.

9) Calibration Firmware
File Name: “PDR_M500.bin”
For calibration only, not for update.

3-3 LCD Calibration Procedure

Tools:
AC Adapter
SD Card with Calibration Firmware
Oscilloscope

Test Points: **Please look at figure 3.3.1.**

GND	(TP608)
R	(TP601)
G	(TP602)
B	(TP600)
PSIG	(TP610) : Trigger Signal

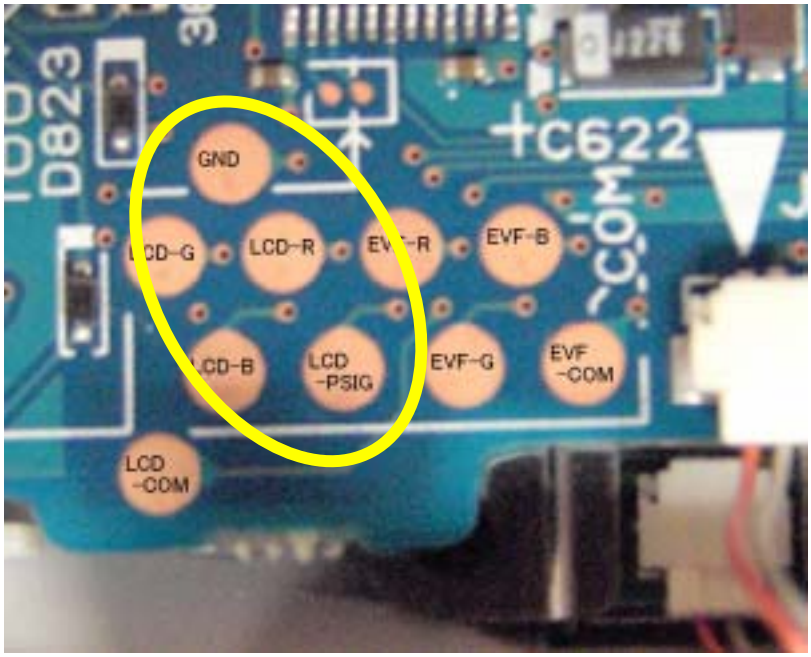


figure 3.3.1.

The setting of Oscilloscope:

CH1(G)	:	AC,1V/div, 20us/div; (TP602)
CH2(R&B)	:	AC, 1V/div, 20us/div; (TP601&TP600)
CH3(PSIG)	:	AC, 1V/div, 20us/div; (TP610)

Procedure:

1. Connect oscilloscope to all Test Points. Attach AC Adapter to camera. Install the SD Card with calibration firmware into camera. Close the card cover. Keep pressing the MENU button and slide the Power switch to power on the camera. “ADJ MENU” is displayed on LCD screen as shown in figure 3.3.2.

Fig. 3.3.2

2. Press the UP/DOWN button to select the item LCD. Then press the RIGHT button to enter LCD menu. Menu items are shown as figure 3.3.3. Press the DISP button to initialize LCD setting. If the image on LCD is NG, press MENU button at most 6 times to let it become normal. If it doesn't work, the camera is NG.

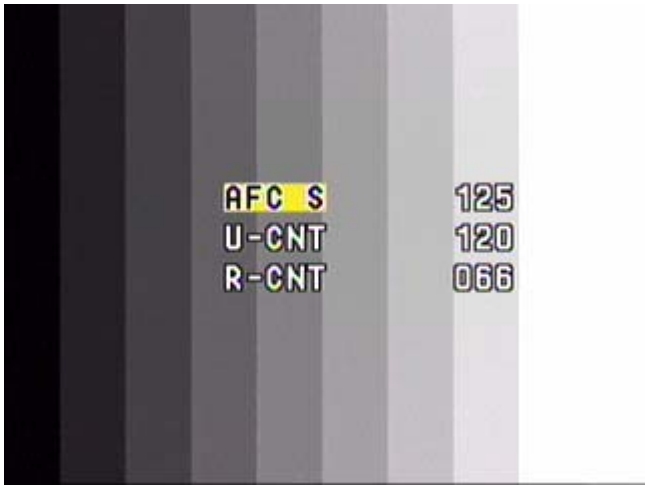


Fig. 3.3.3

3. Press the UP/DOWN button to select the item AFC_S. Then press the RIGHT button.
   Press the UP button until the upper image twists suddenly. Then press the OK button to set the upper limited value.
   Press the DOWN button until the upper image twists again. Then press the OK button to set the lower limited value.
   The center value of upper limit and lower limit will be saved and go back to the LCD adjusting menu automatically.

4. The setting range of Oscilloscope is AC, 1V/div, 20us/div for the observation of the waveform of G signal (TP602).
   Press the UP/DOWN button to select the item BLIM. Then press the RIGHT button to enter. Press the UP/DOWN to adjust the waveform to 8 +/- 0.4V shown as Fig. 3.3.4. Then press OK button to return.

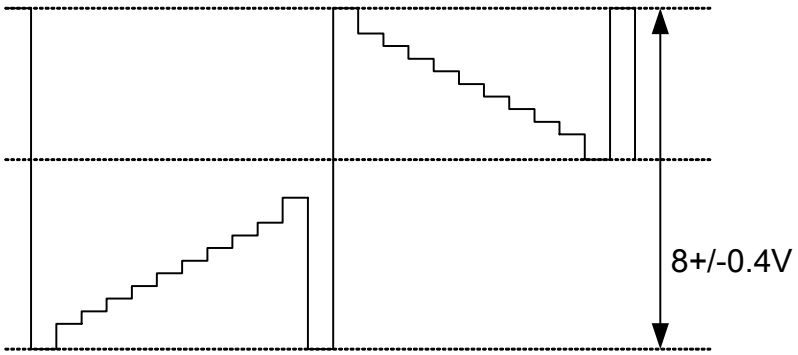


Fig. 3.3.4

5. The setting range of Oscilloscope is AC, 1V/div, 20us/div for the observation of the waveform of G signal (TP602). Press the UP/DOWN button to select the item U_CNT. Then press the RIGHT button.
   Then Press UP/DOWN to set G signal of the black / white peak-peak to 3.0 +/- 0.1V as shown in figure 3.3.5.
   Then press OK button to return.

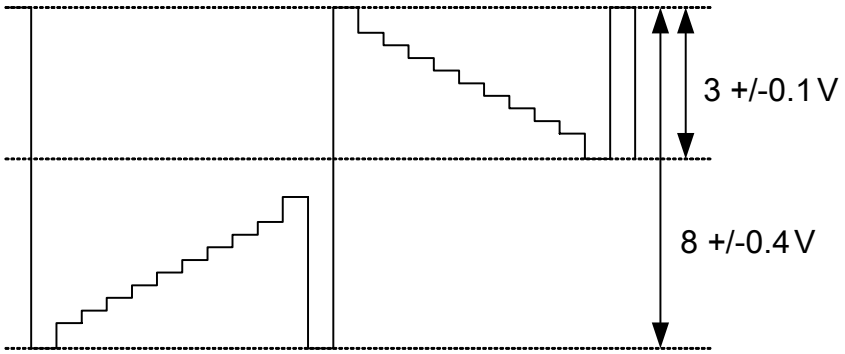


Fig. 3.3.5

6. The setting range of Oscilloscope is AC, 500mV/div, 20us/div, “INV”, “ADD” for the observation of the waveform of G signal (TP602) and R signal (TP601). Press the UP/DOWN button to select the item R_CNT. Then press the RIGHT button.
   Then press UP/DOWN to set G-R signal shown as figure 3.3.6. The waveform within 1H should be adjusted flat.
   Then press OK button to return.

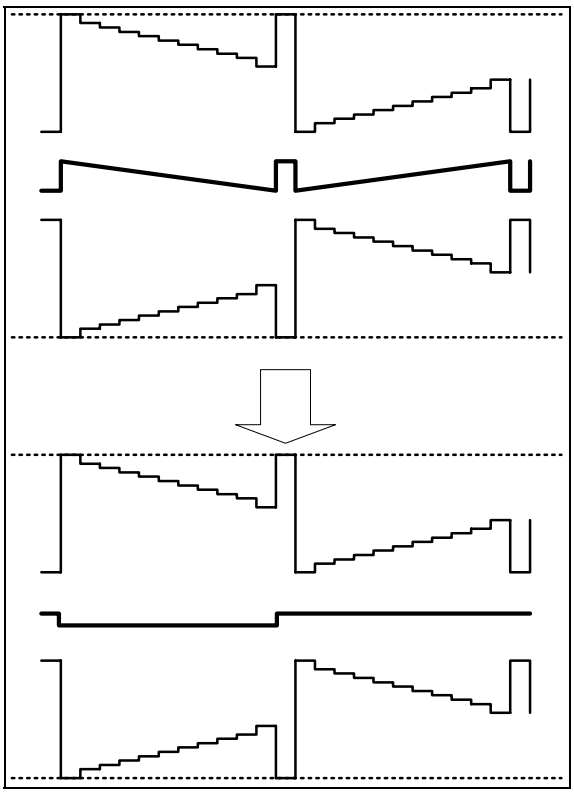


Fig. 3.3.6

7. Press the UP/DOWN button to select the item R-BRT. Then Press the RIGHT button.
   Then press UP/DOWN to set G-R signal shown as figure 3.3.7. The waveform amplitude of G-R signal should be adjusted flat. Then press OK button to return.

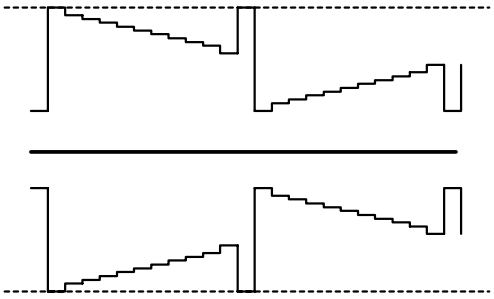


Fig. 3.3.7

8. The setting range of Oscilloscope is AC, 500mV/div, 20us/div, “INV”, “ADD” for the observation of the waveform of G signal (TP602) and B signal (TP600). Press the UP/DOWN button to select the item B_CNT. Then press the RIGHT button.
   Then press UP/DOWN to set G-B signal shown as figure 3.3.8. The waveform within 1H should be adjusted flat. Then press OK button to return.

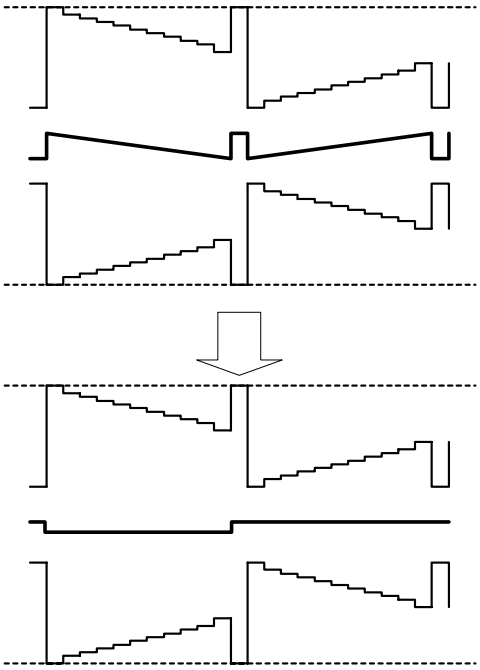


Fig. 3.3.8

9. Press the UP/DOWN button to select the item B-BRT. Then Press the RIGHT button.
   Then press UP/DOWN to set G-B signal shown as figure 3.3.9. The waveform amplitude of G-B signal should be adjusted flat. Then press OK button to return.

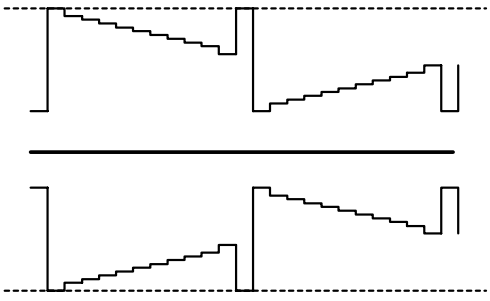


Fig. 3.3.9

10. Press the UP/DOWN button to select the item HPOS. Then press the RIGHT button.
    Press the STROBE button, then white frame will be displayed on LCD as figure 3.3.10. Press UP/DOWN to adjust this frame to the center of LCD. Then press OK button to return.

Fig. 3.3.10

3-4 EVF Calibration Procedure

Tools:
AC Adapter
SD Card with Calibration Firmware
Oscilloscope

Test Points: **Please look at figure 3.4.1.**

GND	(TP705)
R signal	(TP701)
G signal	(TP702)
B signal	(TP703)
COM signal	(TP704) : Trigger Signal

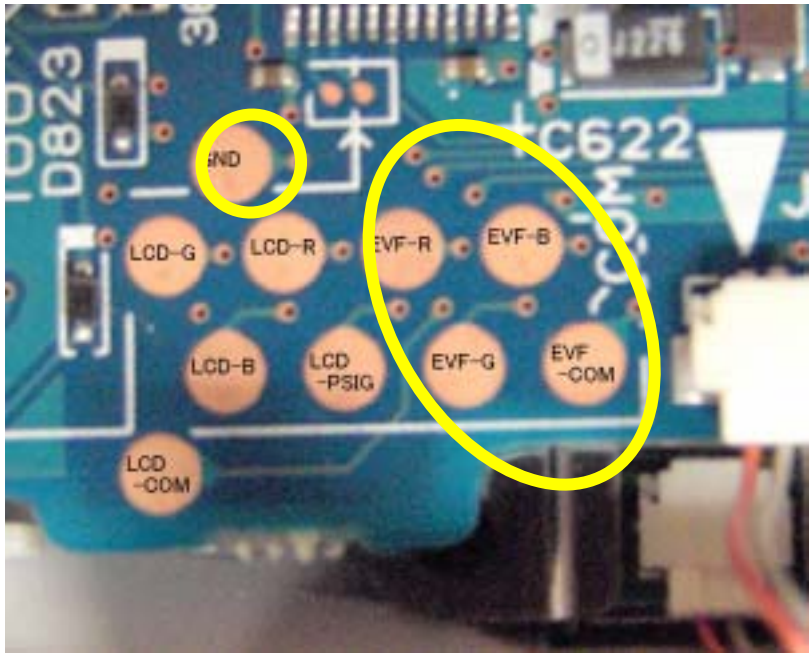


figure 3.4.1.

The setting of Oscilloscope:

Trigger: COM signal (TP704)
GND: GND (TP704)
CH1(G): AC,1V/div, 20us/div; (TP702)
CH2(R&B): AC, 1V/div, 20us/div; (TP701&TP703)
CH3(COM): AC, 1V/div, 20us/div; (TP704); GND(TP705)

Procedure:

1. Connect oscilloscope to all Test Points. Attach AC Adapter to camera. Install the SD Card with calibration firmware into camera. Close the card cover. Keep pressing the MENU button and slide the Power switch to power on the camera. “ADJ MENU” is displayed on LCD screen as shown in figure 3.4.2.

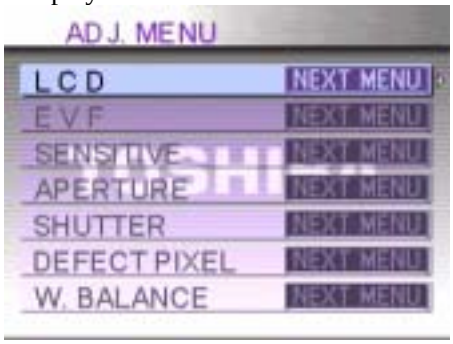


Fig. 3.4.2

2. Press the UP/DOWN button to select the item EVF. Then press the RIGHT button to enter EVF menu. Menu items are shown as figure 3.4.3. Press the DISP button to initialize LCD setting.

Fig. 3.4.3

3. Press the UP/DOWN button to select the item VCO. Press the RIGHT button, then adjustment screen will be changed to EVF from LCD. If the image on EVF is NG, press MENU button at most 6 times to let it become normal. If it doesn't work, the camera is NG.
   Press the UP button until the upper image twists suddenly. Then press the OK button to set the upper limited value. Press the DOWN button until the upper image twists again. Then press the OK button to set the lower limited value. The center value of upper limit and lower limit will be saved and go back to EVF adjusting menu on LCD screen automatically.
4. Press the UP/DOWN button to select the item HPOS. Then press the RIGHT button to enter.
   Then press the STROBE button and a white frame will be displayed on EVF as figure 3.4.4. Press the UP/DOWN to adjust the frame of both left-hand side and right-hand side are clear. Then press OK button to return.

Fig. 3.4.4

5. The setting range of Oscilloscope is AC, 500mV/div, 20us/div for the observation of the waveform of COM signal (TP704). Press the UP/DOWN button to select the item COM A. Then press the RIGHT button. Then Press UP/DOWN to set the COM signal waveform peak-peak to 3.5 +/- 0.18V shown as figure 3.4.5. Then press OK button to return.

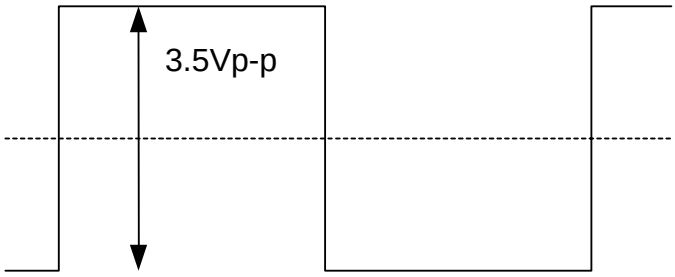


Fig. 3.4.5

6. The setting range of Oscilloscope is AC, 500mV/div, 20us/div for the observation of the waveform of G signal (TP702). Press the UP/DOWN button to select the item U_CNT. Then press the RIGHT button.
   Then press UP/DOWN to set G signal shown as figure 3.4.6. The white level to black level peak-peak voltage should be adjusted 2.3 +/- 0.12V. Then press OK button to return.

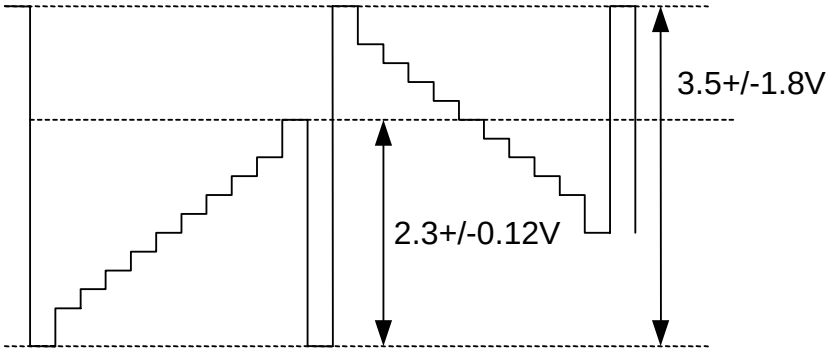


Fig. 3.4.6

7. Press the UP/DOWN button to select the item U-BRT. Then Press the RIGHT button.
   Press UP/DOWN to adjust the waveform of G signal shown as figure 3.4.5. The black level to black level peak-peak voltage should be adjusted 3.5 +/- 1.8V. Then press OK button to return.
8. The setting range of Oscilloscope is AC, 500mV/div, 20us/div, "INV", "ADD" for the observation of the waveform of G signal (TP702) and R signal (TP701). Press the UP/DOWN button to select the item R_CNT. Then press the RIGHT button. Then press UP/DOWN to set G-R signal shown as figure 3.4.7. The waveform within 1H should be adjusted flat. Then press OK button to return.

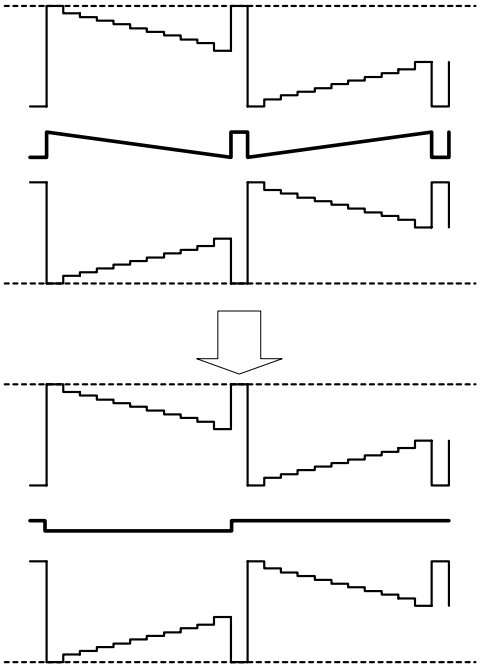


Fig. 3.4.7

9. Press the UP/DOWN button to select the item R-BRT. Then Press the RIGHT button. Press UP/DOWN to set G-R signal shown as figure 3.4.8. The waveform amplitude should be adjusted flat. Then press OK button to return.

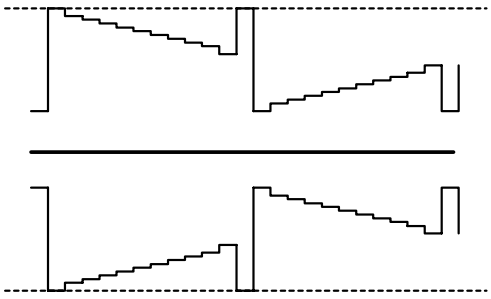


Fig. 3.4.8

10. The setting range of Oscilloscope is AC, 500mV/div, 20us/div, “INV”, “ADD” for the observation of the waveform of G signal (TP702) and B signal (TP703). Press the UP/DOWN button to select the item B_CNT. Then press the RIGHT button. Then press UP/DOWN to set G-B signal shown as figure 3.4.9. The waveform within 1H should be adjusted flat. Then press OK button to return.

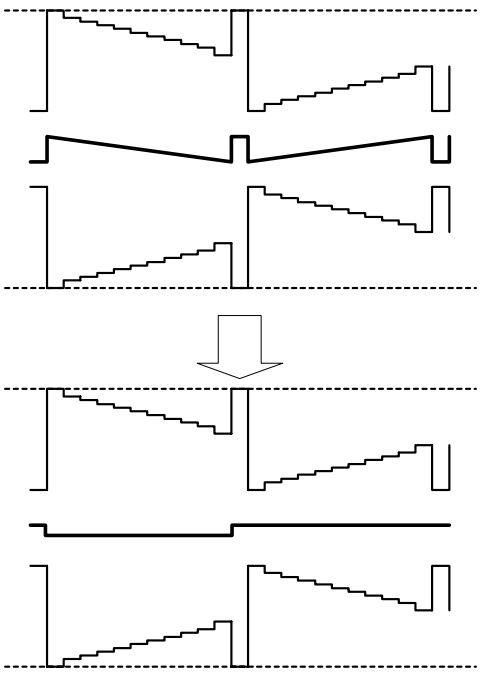


Fig. 3.4.9

11. Press the UP/DOWN button to select the item B-BRT. Then Press the RIGHT button. Press UP/DOWN to set G-B signal shown as figure 3.4.10. The waveform amplitude should be adjusted flat. Then press OK button to return.

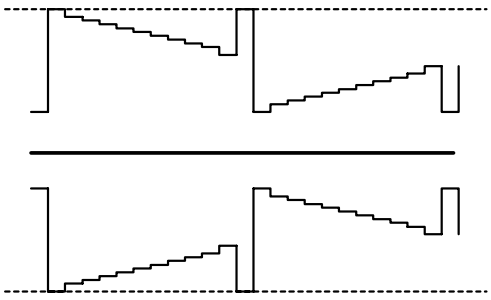


Fig. 3.4.10

3-5 Sensitive, Aperture, and Shutter Calibration Procedure

Tools:
AC Adapter
SD Card with Calibration Firmware
Light Source : Light value is 12+/-0.1 EV; Color temperature is 5100+/-300K. (Fig. 3.5.1)

Fig. 3.5.1

Procedure:

1. Install the SD Card with calibration firmware into camera. Close the card cover.
2. Attach camera to AC Adapter. Keep pressing the MENU button and slide the Power switch to power on the camera.
3. "ADJ MENU" is displayed on LCD screen as shown in figure 3.5.2.
4. Press the UP/DOWN button to select the item SENSITIVE. Then press the RIGHT button to enter SENSITIVE menu. The Lens will move and SENSITIVE MENU is displayed on LCD screen as shown in figure 3.5.3.
5. Put the camera in front of the Light Source. The distance between Lens and Light source is within 2cm. Then press OK button to proceed with the adjustment automatically. If the adjustment is OK, it will display SUCCESS as shown in figure 3.5.4. Press the LEFT button to return. If the LCD displays FAILURE as shown in figure 3.5.5, the camera is NG.

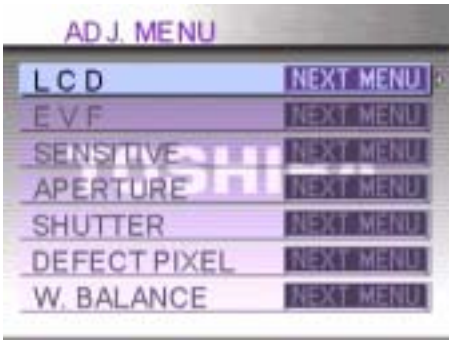


Fig. 3.5.2

Fig. 3.5.3

Fig. 3.5.4

Fig. 3.5.5

6. Press the UP/DOWN button to select the item APERTURE. Then press the RIGHT button to enter APERTURE menu. The APERTURE MENU is displayed on LCD screen as shown in figure 3.5.6.

7. Put the camera in front of the Light Source. The distance between Lens and Light source is from 1cm to 2cm. Then press OK button to proceed with the adjustment automatically. If the adjustment is OK, it will display SUCCESS as shown in figure 3.5.7. Press the LEFT button to return. If the LCD displays FAILURE as shown in figure 3.5.8, the camera is NG.

Fig. 3.5.6

Fig. 3.5.7

Fig. 3.5.8

8. Press the UP/DOWN button to select the item SHUTTER. Then press the RIGHT button to enter SHUTTER menu. The Lens barrel will move and SHUTTER MENU is displayed on LCD screen as shown in figure 3.5.9.
9. Put the camera in front of the Light Source. Then press OK button to proceed with the adjustment automatically. If the adjustment is OK, it will display SUCCESS as shown in figure 3.5.10. Press the LEFT button to return. If the LCD displays FAILURE as shown in figure 3.5.11, the camera is NG.

Fig. 3.5.9

Fig. 3.5.10

Fig. 3.5.11

3-6 Strobe Calibration Procedure

Tools:
AC Adapter
SD Card with Calibration Firmware
18% Gray Chart: Size 1.0m(W) * 1.0m(H)
Dark room: Prepare an environment allowing a complete light sealed.
Test distance: Between lens and chart is 0.9+/-0.1m.

Procedure:
1. Install the SD Card with calibration firmware into camera. Close the card cover.
2. Attach camera to AC Adapter. Keep pressing the MENU button and slide the Power switch to power on the camera.
3. "ADJ MENU" is displayed on LCD screen as shown in figure 3.6.1.
4. Press the UP/DOWN button and the WIDE/TELE button to select the item STROBE on Page 2. Then press the RIGHT button to enter STROBE menu. The Lens move and STROBE ADJUST MENU is displayed on LCD as shown in figure 3.6.2.

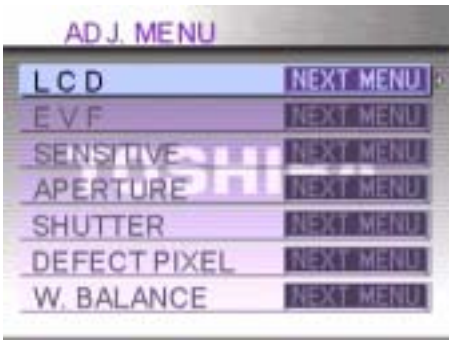


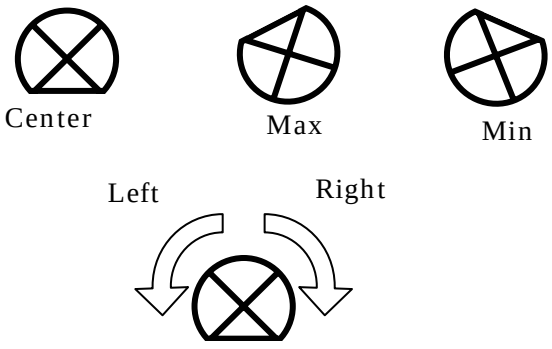
Fig. 3.6.1

Fig. 3.6.2

5. Put the camera into the Dark room. The distance between Lens and Chart is 90cm. Open the pop-up flash unit.
6. Then Press OK button to proceed with the STROBE adjustment. The camera will flash for four times.
7. The LCD will display the turning direction of variable resistor (R177) for adjustment shown as figure 3.6.3 and figure3.6.4.

Fig. 3.6.3 (a)

(b)



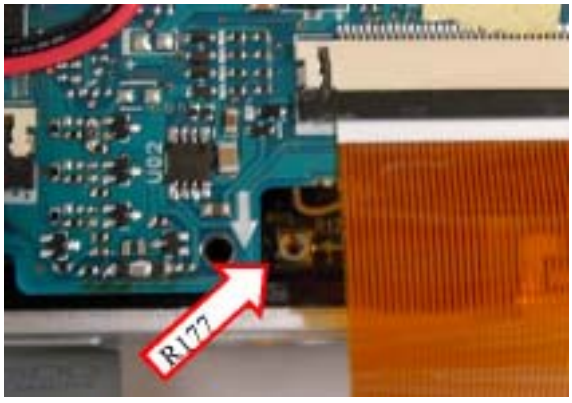


Fig. 3.6.4

8. Repeat the steps above #6 & #7 several times until the LCD displays SUCCESS while the adjustment is OK shown as figure 3.6.5. Press the LEFT button to return.

Fig. 3.6.5

9. If the variable resistor had been turned to 360 degree but the strobe calibration is still fail, the camera is NG.

3-7 Defect Pixel and White Balance Calibration Procedure

Tools:
AC Adapter
SD Card with Calibration Firmware
Light Source : Light value is 12+/-0.1 EV; Color temperature is 5100+/-300K. (Fig. 3.5.1)

Procedure:
1. Install the SD Card with calibration firmware into camera. Close the card cover.
2. Attach AC Adapter to camera. Keep pressing the MENU button and then slide the Power switch to power on the camera.
3. "ADJ MENU" is displayed on LCD screen as shown in figure 3.7.1.
4. Press the UP/DOWN button to select the item DEFECT PIXEL. Then press the RIGHT button to enter DEFECT PIXEL menu. The Lens will move and DEFECT PIXEL MENU is displayed on LCD as shown in figure 3.7.2.
5. Put the camera in front of the Light Source. The distance between Lens and Light source is within 2cm. Then Press OK button to proceed with the adjustment automatically. If the adjustment is OK it will display SUCCESS as shown in figure 3.7.3. Press the LEFT button to return. If the LCD displays FAILURE shown as figure 3.7.4, the camera is NG.

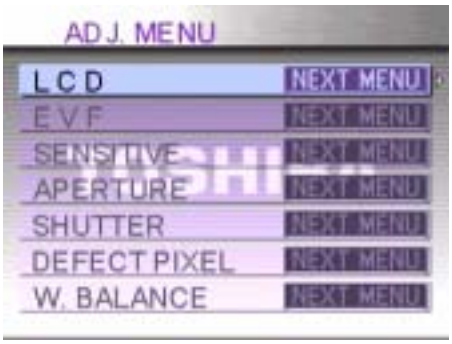


Fig. 3.7.1

Fig. 3.7.2

Fig. 3.7.3

Fig. 3.7.4

6. Press the UP/DOWN button to select the item W. BALANCE. Then press the RIGHT button to enter W. BALANCE menu. W. BALANCE menu is displayed on LCD as shown in figure 3.7.5.
7. Put the camera in front of Light Source. Then Press OK button to proceed with the adjustment automatically. If the adjustment is OK, the TFT LCD will display SUCCESS as shown in figure 3.7.6. Press the LEFT button to return. If the LCD displays FAILURE shown as figure 3.7.7, the camera is NG.

Fig. 3.7.5

Fig. 3.7.6

Fig. 3.7.7

3-8 Focus Calibration Procedure

Tools:
AC Adapter
SD Card with Calibration Firmware
Collimator Lens ; f = 450mm
Chart: Supplied as PDF file "TEST_CHART.pdf" used by printing on A3 size.
Test distance : Between collimator lens and chart is 450mm.
(Please confirm collimator lens manual so that the distance of camera and chart may be infinity.)

Procedure:

1. Install the SD Card with calibration firmware into camera. Close the card cover.
2. Attach AC Adapter to camera. Keep pressing the MENU button and slide the Power switch to power on the camera.
3. "ADJ MENU" is displayed on LCD screen as shown in figure 3.8.1.
4. Press the UP/DOWN button to select the item FOCUS. Then press the RIGHT button to enter FOCUS menu. The Lens will move and FOCUS MENU is displayed on LCD as shown in figure 3.8.2.
5. Adjust the position of the collimator lens so that the distance of a camera and chart may be infinity. Put the camera into front of the collimator lens within 50mm. Then press OK button to proceed with the FOCUS adjustment automatically. If the adjustment is OK, the TFT LCD will display SUCCESS as shown in figure 3.8.3. Press the LEFT button to return. If the LCD displays FAILURE shown as figure 3.8.4, the camera is NG.

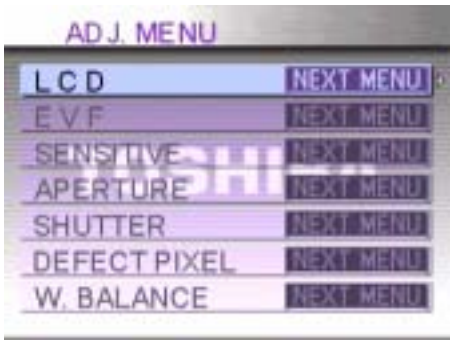


Fig. 3.8.1

Fig. 3.8.2

Fig. 3.8.3

Fig. 3.8.4

3-9 F/W Update Procedure

Tools:
AC Adapter
SD Card with Update Firmware

Procedure:
1. Install the SD card with firmware update program into camera. Close the card cover.
2. Attach AC Adapter to camera. Keep pressing the ERASE button and then slide the Power switch to power on the camera.
3. The camera displays update information on the TFT LCD as shown in figure 3.9.1
4. The update procedure will be finished when it displays COMPLETED message on LCD shown as figure 3.9.2. Turn off the camera and remove the SD Card.

Fig. 3.9.1

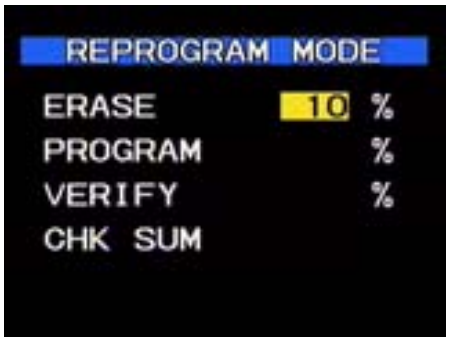


Fig. 3.9.2

5. Turn the mode dial to SETUP mode and slide the Power switch to power on the camera.
6. Press the UP/DOWN button to select the item LANGUAGE. Then press the SELF-TIMER button and SHUTTER button together to enter the area code menu as shown in figure 3.9.3.
7. Press the UP/DOWN button to select the correct area then press ENTER.
8. It displays the version information as shown in figure 3.9.4. Check the relative information and make sure the software version is updated.

Area Code	Place	OSD Language	Video Output	The Time & Date format
A	North America	English	NTSC	MM.DD.YYYY
J	Japan	Japanese	NTSC	YYYY.MM.DD
E	Europe	English	PAL	DD.MM.YYYY
(U)	UK	English	PAL	DD.MM.YYYY
C	China	Simplified Chinese	PAL	YYYY.MM.DD

Attention: The firmware will be damage if the power supply is stopped while proceeding update.

Fig. 3.9.3

Fig. 3.9.4

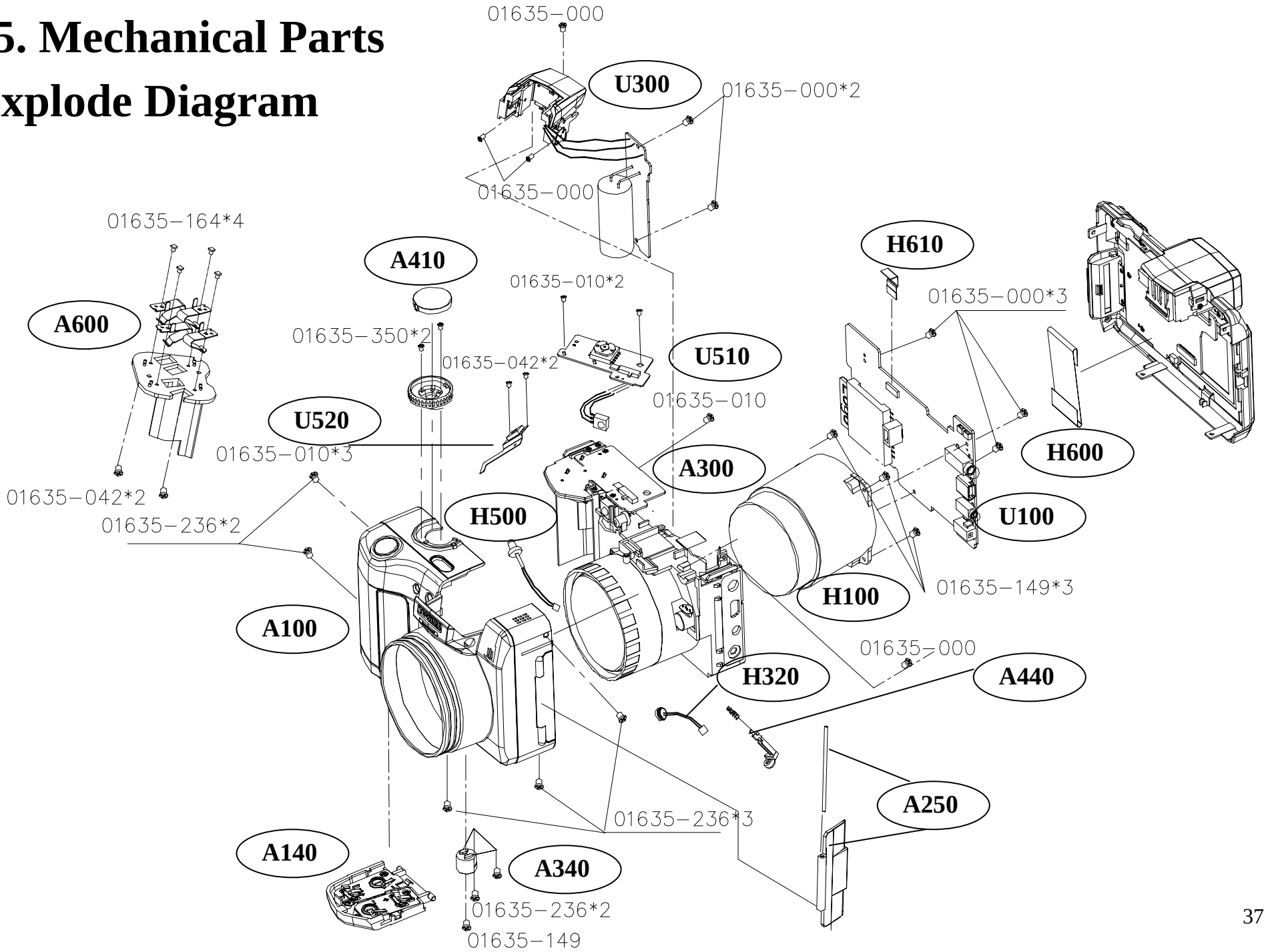
Section 4. Troubleshooting

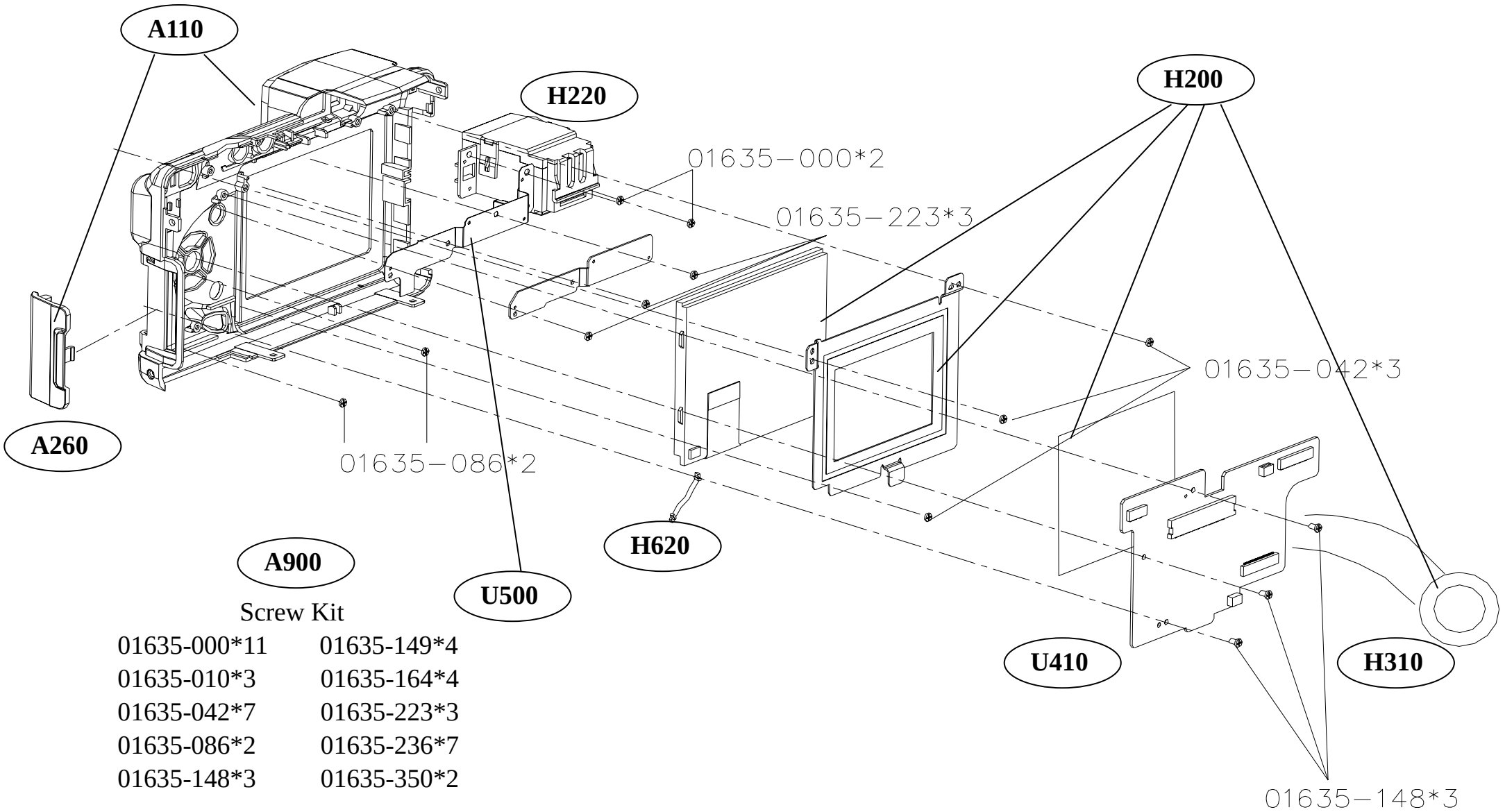
Item	Status	Analysis	How to fix
1	No Image at shooting	CCD FPC break CCD NG AD coverter NG TG NG CCD PCB NG	Replace the Lens Module ASSY(H100).
2	Width line noise and Length line noise	Width line noise or Length line noise is occurred on the Image, CCD or AD converter is NG	Replace the Lens Module ASSY(H100).
3	Brightness NG	When Image is too dark or too bright, the lens or lens adjustment is NG.	Replace the Lens Module ASSY(H100). Re-adjustment AE. Replace the Main PCB ASSY(U100).
4	Focus NG	When Focus does not suit, lens or lens adjustment is NG.	Replace the Lens Module ASSY(H100). Re-adjustment AF. Replace the Main PCB ASSY(U100).
5	Shotting picture NG (Blue)	The Image becomes bluish,lens shutter or electric shutter function of CCD is NG.	Replace the Lens Module ASSY(H100). Replace the Main PCB ASSY(U100).
6	Can not receive the Remote Controller	Remote Controller Battery is not available. Remote Controller Receiver (U1) NG.	Change remote controller Battery. Replace the Mode PCB ASSY(U510).
7	Voice can not recording	Disconnection of Microphone wiring. AMP (U101) of Microphone is NG Voice CODEC (U101) NG	Replace the Main PCB ASSY(U100). Replace the Microphone ASSY(H320).
8	Voice can not playing	Disconnection of Speaker wiring. AMP (U101) of Speaker is NG Voice CODEC (U101) NG	Replace the LCD PCB ASSY(U410). Replace the Main PCB ASSY(U100). Replace the Speaker ASSY(H310).
9	Voice can not playing (LINE OUT)	Connection is poor (J556) Voice CODEC (U101) NG	Replace the Main PCB ASSY(U100).
10	Video sign output NG	DSP (U901) NG Video driver (U550) NG Video filter (L703, L704) NG	Replace the Main PCB ASSY(U100).
11	USB connection NG	J 553 connection NG DSP(U901) NG	Replace the Main PCB ASSY(U100).
12	SD card reading and writing NG	SD card connection is fail. (J552) DSP (U901) NG	Replace the Main PCB ASSY(U100).
13	Zoom lens NG	Motor driver (U505) NG J501 poor connection	Replace the Main PCB ASSY(U100).
14	EVF No Backlight	EVF Backlight-drive IC (U02) NG SUB-CPU (U405) NG	Replace the Main PCB ASSY(U100). Replace the Electric View Finder ASSY(H220).
15	LCD No Backlight	LCD Backlight-driver IC (U03) NG	Replace the Main PCB ASSY(U100). Replace the Color LCD ASSY(H200).
16	Power ON NG (Shooting)	+15 Valtage line, -7 voltage line NG U10 NG	Replace the Main PCB ASSY(U100). Replace the Lens Module ASSY(H100).
17	Power ON NG	Fuse F01, F02 NG A voltage difect line of CPU NG	Replace the Main PCB ASSY(U100).
18	"Card lid open"	Card lid swith (S1) NG SUB-CPU (U405) NG	Replace the Main PCB ASSY(U100).
19	Flash lost	Flash Pop-up swith (J401) NG or wires breaks	Replace the Main PCB ASSY(U100). Replace the Flash PCB Kit(U300).
20	Calibration data writing NG	Q301 transistor NG	Replace the Main PCB ASSY(U100).
21	No Image on EVF	EVF driver IC (U702) NG J701 poor connection Rear FPC NG	Replace the LCD PCB ASSY(U410). Replace the Main PCB ASSY(U100). Replace the Electric View Finder ASSY(H220).
22	No Image on LCD	LCD driver IC (U600) NG J601 poor connection Rear FPC NG	Replace the LCD PCB ASSY(U410). Replace the Color LCD ASSY(H200).

23	UP, CENTER, DOWN, LEFT, TRUSH, DISP, MENU key are not effective	Swith (S809, S810, S811, S812, S813, S814, S815) NG	Replace the LCD PCB ASSY(U410). Replace the Flex Cable Main-LCD(H600).
24	Finder LED (Red and Green) is not flash	LED drive transister (Q801) NG Poor Connection	Replace the Switch PCB ASSY(U500). Replace the Main PCB ASSY(U100). Replace the LCD PCB ASSY(U410).
25	INFO, Flash, Wide and Tele are not effective	Swith (S804, S805, S806, S807) NG Poor Connection	Replace the Switch PCB ASSY(U500). Replace the LCD PCB ASSY(U410). Replace the Flex Cable Main-LCD(H600).
26	Front LED is not flash	J04 poor connection NG or wires breaks Drive-transistor (Q803, Q804, Q805) NG	Replace the Main PCB ASSY(U100). Replace the wires of Main-Flash.
27	"Lens Error" An Error code is appeared.	Lens NG: Zoom is fail Lens Unit NG Motor driver IC (U505) NG Error001: Flash is not charging. T150 transformer NG Q153 FET NG Error002: Focus is fail. Lens unit NG Motor drive IC (U505) NG Error003: Iris is fail. Lens unit NG Motor drive IC (U505) NG Error004: Shutter is fail Lens unit NG Motor drive IC (U505) NG	Replace the Lens Module ASSY(H100). Replace the Main PCB ASSY(U100). Replace the Flash PCB Kit(U300).
28	Over exposure when using flash (A picture white out)	Photo Senser NG	Replace the Photo Sensor ASSY(H500).
29	Sometime the flash is not fire.	Flash Senser NG The Xenon life	Replace the Flash PCB Kit(U300).
30	Flash is not fire.	IGBT(Q165) NG	Replace the Flash PCB Kit(U300).
31	Battery NG	Q20FET is broken	Replace the Main PCB ASSY(U100).
32	AC Adapter NG	D02 is broken.	Replace the Main PCB ASSY(U100).
33	A sound is not recorded with an external microphone.	J106 is broken.	Replace the Main PCB ASSY(U100).

Section 5. Mechanical Parts

5-1 Explode Diagram





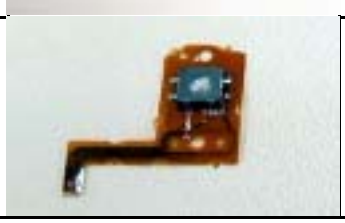
Screw Kit

01635-000*11	01635-149*4
01635-010*3	01635-164*4
01635-042*7	01635-223*3
01635-086*2	01635-236*7
01635-148*3	01635-350*2

5-2 Camera Part Photo

Part Code	Parts Name	Description	Q'ty/Unit	Toshiba P/N	Premier P/N
Mechanical Parts					
A100	Front Cover ASSY		**1**	P000384450	9E284-0004
A110	Rear Cover ASSY		**1**	P000384460	9E284-0009
A140	Battery Cover ASSY		**1**	P000384470	9D344-7000-3DJ
A250	Jack Cover		**1**	P000384480	9E284-0010
A260	Card Cover		**1**	P000384490	9E234-009-3DJ
A300	Main Frame		**1**	P000382750	9D384-0008
A340	Tripod Holder		**1**	P000382760	9D334-035
A410	Mode Dial		**1**	P000384500	9E284-0003
A440	Flash Open Switch		**1**	P000384510	9E284-0006

Part Code	Parts Name	Description	Q'ty/Unit	Toshiba P/N	Premier P/N
A600	Battery Terminal		**4**	P000382790	9D335-013
A900	Screw Kit		**1**	P000382800	9D384-1635
Module					
H100	Lens Module ASSY		**1**	P000384520	9E246-0000
H200	Color LCD		**1**	P000382820	9D384-0011
H220	Electric View Finder ASSY		**1**	P000382830	9D346-1000
H310	Speaker ASSY		**1**	P000382840	02437-70G
H320	Microphone ASSY		**1**	P000382850	9D347-0002
H500	Photo Sensor ASSY		**1**	P000382860	9D347-0001

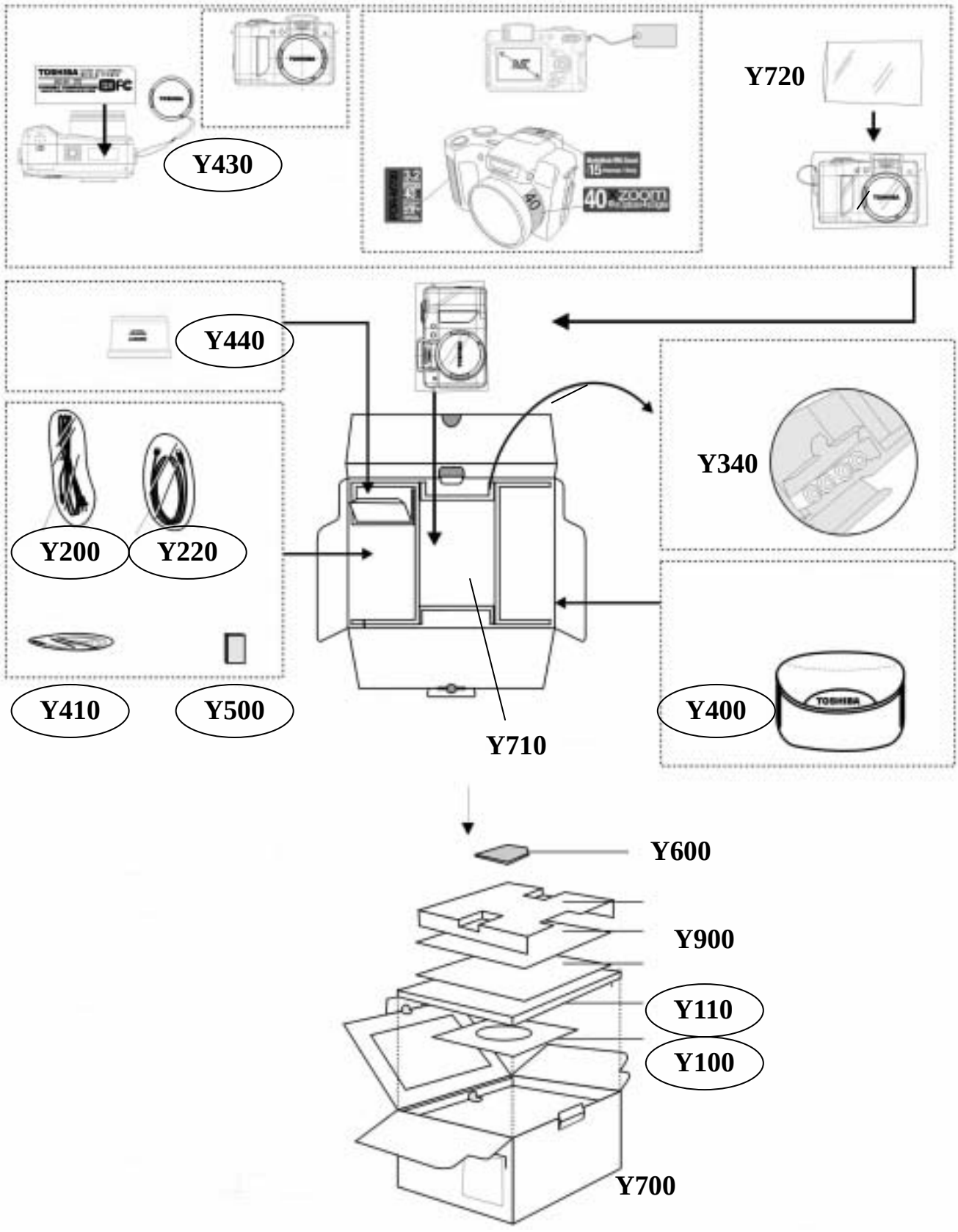
Part Code	Parts Name	Description	Q'ty/Unit	Toshiba P/N	Premier P/N
H600	Flex Cable Main-LCD		**1**	P000382870	9D337-103
H610	Flex Cable Main-Mode		**1**	P000382880	9D337-105
H620	LCD Wire 2P		**1**	P000382890	02547-201C
Board Assembly					
U100	Main PCB ASSY		**1**	P000384530	9E247-4000
U300	Flash PCB KIT		**1**	P000384540	9D344-9100-3DJ
U410	LCD PCB ASSY		**1**	P000382920	9D347-5000
U500	Switch PCB ASSY		**1**	P000382930	9D347-1010
U510	Mode PCB ASSY		**1**	P000382940	9D347-0007
U520	Shutter PCB ASSY		**1**	P000382950	9D347-1020

5-3 Screw List

	Part Name	Position Used	Specification	Qty
1	01635-000	Flash PCB kit*5, Main Frame*1, Main PCB*3, Elec. View Finder*2	S:1.7*3*A0.5 BL	11
2	01635-010	Mode PCB*2, Battery Chamber*1	S:1.7*2.5*A0.5 BL	3
3	01635-042	Color LCD Holder*3, Shutter PCB*2, Battery Chamber*2	S:1.7*2*A0.5 BL	7
4	01635-086	Card Cover*2	S:1.2*2*A0.4 BL	2
5	01635-148	LCD PCB*3	S:1.4*2.5*A0.5 BL	3
6	01635-149	Lens module*3, Tripod Holder*1	S:1.7*4*A0.5 BL	4
7	01635-164	Battery Terminal*4	S:1.4*1.5*A0.4 BL/H	4
8	01635-223	Switch PCB*3	S:1.4*2.5*A0.2 BL/H	3
9	01635-236	Front Cover*5, Tripod Holder*2	S:1.7*4*A0.3 NI/H	7
10	01635-350	Mode Dial*2	S:M1.7*2*A0.3 NI	2

Section 6. Packing Parts

6-1 Packing Explode Diagram



6-2 Packing Part List

Part Code	Parts Name	Pcs/Set	Remark
Y100	CD-ROM	1	
Y110	Instruction Manual	1	
Y200	USB Cable	1	
Y220	AV Cable	1	
Y340	Alkaline Battery	1	
Y400	Camera Case	1	
Y410	Shoulder Strap	1	
Y430	Lens Cap	1	
Y440	Adapter Ring	1	
Y500	IR Remote Controller	1	
Y600	SD Card	1	
Y700	Gift Box	1	
Y710	Partition	1	
Y720	PE Bag	1	
Y900	Warranty	1	
Y990	Notice Sheet Set	1	

Section 7. Service Part List

Safety	Part Code	Parts Name	Description	Region of Origin	Pcs /Set	Premier P/N	Toshiba P/N	New	Component
Mechanical Parts									
	A100	Front Cover ASSY	COVER ASSY, FRONT, SILVER, PDR-M500	China	1	9E284-0004	P000384450	*	Cover, Power Switch, Shutter button, Ring, Rubber, Remote Cover, Front LCD Cover, Rating Label, Toshiba Logo and Tripod Holder
	A110	Rear Cover ASSY	COVER ASSY, REAR, SILVER, PDR-M500	China	1	9E284-0009	P000384460	*	Cover, Card Cover, 5-key&Menu&Delete Buttons, Zoom Buttons, Flash&Timer Buttons, Finder Cover and Finder Cover Holder
	A140	Battery Cover ASSY	COVER ASSY, BATTERY, SILVER, PDR-M500	China	1	9D344-7000-3DJ	P000384470	*	Cover, Lock Switch, Terminals and Sponges.
	A250	Jack Cover	COVER, JACK, SILVER, PDR-M500	China	1	9E284-0010	P000384480	*	Cover and Pin.
	A260	Card Cover	COVER, CARD, SILVER, PDR-M500	China	1	9E234-009-3DJ	P000384490	*	Cover.
	A300	Main Frame	FRAME, MAIN, BLACK, PDR-M700	China	1	9D384-0008	P000382750		Strap Holder and Battery Terminal.
	A340	Tripod Holder	HOLDER, TRIPOD, BLACK, PDR-M700	China	1	9D334-035	P000382760		Holder.
	A410	Mode Dial	DIAL, MODE, SILVER, PDR-M500	China	1	9E284-0003	P000384500	*	Mode Dial Base, Mode Dial Cap and 2 Screws.
	A440	Flash Open Switch	SWITCH, FLASH OPEN, SILVER, PDR-M500	China	1	9E284-0006	P000384510	*	Switch and Spring.
	A600	Battery Terminal	TERMINAL, BATTERY, GOLD & Gray, PDR-	China	4	9D335-013	P000382790		Terminals.
	A900	Screw Kit	SCREW, KIT, PDR-M700	China	1	9D384-1635	P000382800		All Screws.
Module									
	H100	Lens Module ASSY	LENS UNIT, PDR-M500	Japan	1	9E246-0000	P000384520	*	Lens, CCD PCB ASSY and Flex Cable.
	H200	Color LCD ASSY	LCD ASSY, COLOR, PDR-M700	Japan	1	9D384-0011	P000382820		LCD, LCD Holder and Speaker.
	H220	Electric View Finder ASSY	LCD, FINDER, PDR-M700	Japan	1	9D346-1000	P000382830		EVF.
	H310	Speaker ASSY	SPEAKER ASSY, PDR-M700	Japan	1	02437-70G	P000382840		Speaker and Ring Shield.
	H320	Microphone ASSY	MICROPHONE ASSY, PDR-M700	Japan	1	9D347-0002	P000382850		Microphone, Sponge and Lead Wire.
	H500	Photo Sensor ASSY	SENSOR ASSY, PHOTO, PDR-M700	Japan	1	9D347-0001	P000382860		Sensor , Lead Wire and
	H600	Flex Cable Main-LCD	CABLE, FLEXIBLE, MAIN-LCD, PDR-M700	China	1	9D337-103	P000382870		Cable.
	H610	Flex Cable Main-Mode	CABLE, FLEXIBLE, MAIN-MODE, PDR-M700	China	1	9D337-105	P000382880		Cable.
	H620	LCD Wire 2P	WIRE, LCD, 2P, PDR-M700	China	1	02547-201C	P000382890		Wire.
Board Assembly									
	U100	Main PCB ASSY	PC BOARD ASSY, MAIN, PDR-M500	China	1	9E247-4000	P000384530	*	PCB.
	U300	Flash PCB KIT	PC BOARD ASSY, FLASH, PDR-M500	China	1	9D344-9100-3DJ	P000384540	*	PCB, Flash Unit, Flash Base and Capacitor.
	U410	LCD PCB ASSY	PC BOARD ASSY, LCD, PDR-M700	China	1	9D347-5000	P000382920		PCB.
	U500	Switch PCB ASSY	PC BOARD ASSY, SWITCH, PDR-M700	China	1	9D347-1010	P000382930		PCB and PCB Holder. (with bending)
	U510	Mode PCB ASSY	PC BOARD ASSY, MODE, PDR-M700	China	1	9D347-0007	P000382940		PCB and IR Sensor.
	U520	Shutter PCB ASSY	PC BOARD ASSY, SHUTTER, PDR-M700	China	1	9D347-1020	P000382950		PCB
Packing Assembly									
	Y100	CD-ROM	CDROM, DISC, PDR-CD04	China	1	9D339-A00-TOS	P000382960		Disc.
!	Y110	Instruction Manual	OWNERS MANUAL, ENGLISH/FRENCH/SPANISH, PDR-M700	China	1	9E239-400-TOS	P000382970		Manual.
	Y200	USB Cable	CABLE, USB, PDR-M700	China	1	02547-1026	P000383030		Manual.
	Y220	AV Cable	CABLE, AV, PDR-M700	China	1	025-520001-10	P000383040		Cable.
	Y400	Camera Case	CAMERA CASE, BLACK, PDR-M700	China	1	9E239-300-TOS	P000383050		Case.
	Y410	Shoulder Strap	STRAP, SHOULDER, GRAY, PDR-M700	China	1	9E238-000-TOS	P000383060		Strap.
	Y430	Lens Cap	CAP, LENS, GRAY, PDR-M700	China	1	9D384-0012	P000383380		Cap, Cap Spring and Lens Strap.
	Y440	Adapter Ring	ADAPTER RING, SILVER, PDR-M700	China	1	9D334-040-99	P000383350		Ring.
	Y500	IR Remote Controller	REMOCON, IR, PDR-M700	China	1	02047-3014	P000383360		Controller.

* The price is according to the quotation from Sales Dept

Section 8. Specifications

Model name	PDR-M500
Sensor	1/2.7” CCD sensor (total pixel count: Approx. 2.14 million)
Sensitivity	Manual setting: Equivalent to ISO 70/100/200/400 Automatic setting: Equivalent to ISO70/100/200/400/70 to 200/70 to 400
Lens	10X optical zoom lens F2.8 - F3.1
Focal distance	f=5.7 mm - 57 mm (equivalent to 37 mm - 370 mm on a 35 mm camera)
Finder	Electronic View Finder
Auto-focus	TTL system. AF, focus adjusting range: approxi. 10 cm to infinity (Wide side setting) Detection system: Contrast detection system (frame rate during detection: 30 Hz)
Photometry mode	Center Priority Photometry, Spot Photometry
Exposure control system	Program AE, Aperture-priority, Shutter-priorrity, Manual
Exposure compensation	-2.0 EV to +2.0 EV (in 1/3 EV increments)
Aperture	F2.8 to F8 automatic selection, manual selection possible
Shutter speed	1/2 to 1/2000 sec. (electronic shutter and mechanical shutter) Maximum 16 sec. For extended exposure photography
White balance	Auto/manual setting selectable (7 modes)
Focal range	Standard: Approx. 50 cm to infinity (Wide side setting), approx. 1.2 m to infinity (Tele side setting) Macro: Approx. 10 cm to infinity (Wide side setting), approx. 90 cm to infinity (Tele side setting)
Self-Timer	Time selectable between 2 seconds/10 seconds selectable
Flash settings	Auto firing mode (automatic in low-brightness conditions)/ Red-eye Reduction/Forced Flash/Suppressed Flash/Slow Sync Focal range: Approx. 0.5 m to 4.4 m (Tele side setting, ISO 400)
Date/time	Simultaneously Recorded to image data (Exif file format)
Automatic calendar function	Automatically adjusted until the year 2099
LCD monitor	2.5” low-temperature polysilicon TFT (117,600 pixels)
Interface	DC IN 5V terminal: 5 VDC DIGITAL terminal: USB (Ver. 1.1, Mass storage class compatible) AV terminal: Supplied AV cable compatible MIC (external microphone IN) terminal (compatible mike: Diameter: 3.5 mini-plug, monophonic, output impedance 1.8 ohm
Power	4 × AA (Alkaline, Ni-MH or Lithium) batteries Two CR-V3 Lithium Battery Packs or AC adapter (PDR-AC20) (sold separately)
Recording medium	Supports SD memory cards 8/16/32/64/128/256/512 MB
Compressed format	JPEG compliant
Image file format	Exif Ver. 2.2 compliant
Compatibility rules	DCF Ver. 1.0 compliant
Operating environment	Temperature: +32 °F (±0°C) to +104 °F (+40 °C) (during operation)/-4°F (-20°C) to +140 °F (+60 °C) (during storage) Humidity: 30% to 80% (during operation) no condensation
Dimensions	109.6 mm × 76.8 mm × 66.0 mm (W × H × D) excluding protrusions
Weight	Approx. 300g (excluding accessories, batteries, SD card)

TOSHIBA CORPORATION
1–1, SHIBAURA 1– CHOME, MINATO – KU, TOKYO 105 – 8001, JAPAN